

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A method of making a diamond product by etching, said method comprising the steps of:

forming a diamond substrate with a mask layer; and

etching said diamond substrate formed with said mask layer with a plasma of a mixed gas composed of a gas containing an oxygen atom and a gas containing a fluorine atom;

wherein said fluorine atom has a concentration within the range of 0.04% to 6% with respect to the total number of atoms in said mixed gas, thereby to form the diamond product having a projection having a side face with an angle of inclination of at least 78 degrees.
2. (Original) A method of making a diamond product according to claim 1, wherein said plasma is produced by generating a high-frequency discharge between two plate electrodes arranged in parallel; and

wherein said high-frequency discharge is generated by supplying an electric power of at least 0.45 W/cm² between said plate electrodes.
3. (Original) A method of making a diamond product according to claim 1, wherein said gas containing said fluorine atom is CF₄ gas; and

wherein said CF₄ gas has a concentration within the range of 0.02% to 3% with respect to the total number of molecules in said mixed gas.
4. (Original) A method of making a diamond product according to claim 1, wherein said gas containing said oxygen atom is one of O₂, CO₂, and a mixed gas composed of O₂ and CO₂.

Claims 5-7 (Cancelled)

8. (Currently Amended) A method of making a diamond product by etching, said method comprising the steps of:

forming a diamond substrate with a mask layer; and

etching said diamond substrate formed with said mask layer with a plasma of a mixed gas composed of a gas containing an oxygen atom and a gas containing a halogen atom;

wherein, in an emission spectrum of said mixed gas, an intensity A of an emission peak caused by said oxygen atom and an intensity B of an emission peak caused by oxygen have an intensity ratio A/B which is greater than the intensity ratio A/B obtained from an emission of a plasma which is 100% oxygen thereby to make the etched surface to be a substantially vertical.

9. (Original) A method of making a diamond product according to claim 8, wherein said gas containing said halogen atom is CF₄, and wherein said mixed gas further contains nitrogen gas.

10. (Original) A method of making a diamond product according to claim 8, wherein said emission peak caused by said oxygen atom has a half width of 3 nm or less, and wherein said emission peak caused by oxygen has a half width greater than 3 nm.

11. (New) A method of making a diamond product by etching, said method comprising the steps of:

forming a diamond substrate with a mask layer; and

etching said diamond substrate formed with said mask layer with a plasma of a mixed gas composed of a gas containing an oxygen atom and a gas containing a fluorine atom;

wherein said fluorine atom has a concentration within the range of 0.04% to 6% with respect to the total number of atoms in said mixed gas, thereby to form the diamond product having a recess having a side face with an angle of inclination of at least 78 degrees.